



**Formerly Used Defense Site  
Scioto Ordnance Plant  
Marion, Ohio**

**Former Magazine Area  
Preliminary Site Evaluation**



*Prepared for*  
***U.S. Army Corps of Engineers***  
***Louisville District***  
**Louisville, Kentucky**

Total Environmental Restoration Contract  
DACW27-97-D-0015 Task Order 0005

April 2000



FORMERLY USED DEFENSE SITE  
SCIOTO ORDNANCE PLANT  
MARION, OHIO

FORMER MAGAZINE AREA  
PRELIMINARY SITE EVALUATION

Prepared for:

U.S. Army Corps of Engineers  
Louisville District  
Louisville, Kentucky

Prepared by:

Montgomery Watson  
Total Environmental Restoration Contract  
DACW27-97-D-0015  
Task Order 0005

April 2000

## TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
EXECUTIVE SUMMARY	
1.0 INTRODUCTION.....	1-1
1.1 PURPOSE AND SCOPE .....	1-1
2.0 BACKGROUND INFORMATION.....	2-1
2.1 LOCATION.....	2-1
2.2 LAND USE.....	2-1
2.3 PHYSICAL SETTING.....	2-2
2.3.1 Climate.....	2-2
2.3.2 Topography, Physiography and Drainage .....	2-2
2.3.3 Geology .....	2-2
2.3.3.1 Glacial Geology.....	2-3
2.3.3.2 Bedrock Geology.....	2-3
2.3.4 Soils.....	2-3
2.3.5 Natural Resources .....	2-4
2.4 SITE HISTORY .....	2-4
2.5 REGULATORY ACTIONS.....	2-6
3.0 PATHWAY AND ENVIRONMENTAL HAZARD ASSESSMENT.....	3-1
3.1 GROUNDWATER .....	3-1
3.2 SURFACE WATER.....	3-2
3.3 SOIL EXPOSURE AND AIR.....	3-3
4.0 SUMMARY AND RECOMMENDATIONS.....	4-1
5.0 REFERENCES.....	5-1

## LIST OF FIGURES

### Figure No.

- |   |                                       |
|---|---------------------------------------|
| 1 | Site Location Map                     |
| 2 | Scioto Ordnance Plant                 |
| 3 | Grandview Estates Location Map        |
| 4 | Magazine Area Layout                  |
| 5 | Grandview Estates Housing Development |
| 6 | Magazine Building Photo (1943)        |

## LIST OF APPENDICES

### Appendix

- |   |   |  |
|---|---|--|
| A | - | EDR Search Report                                      |
| B | - | Select Aerial Photos (1951, 1955, 1961, 1970 and 1974) |
| C | - | Photos from May 1999 site visit                        |
| D | - | Interview with Donnie Pearson                          |

## EXECUTIVE SUMMARY

Montgomery Watson was contracted to perform a Preliminary Site Evaluation (SE) for the United States Army Corps of Engineers (USACE) on a portion of the former Scioto Ordnance Plant (SOP) previously known as the Magazine Area. The former Magazine Area has been redeveloped and is now the Grandview Estates housing development.

The former SOP is located one mile northeast of Marion, Ohio and was originally built on approximately 12,500 acres of farm land. Approximately 582 acres of this land was utilized for the construction of a Magazine Area - a storage area of 177 building used for loading, containerizing, transferring, storing and shipping of materials produced at the SOP. In 1956, the land was bought by a developer, Mr. Trachsel, owner of Empire Builders and developed as Grandview Estates. Grandview Estates is a housing development consisting of approximately 500 homes and 1,600 to 1,800 residents.

Based on the information reviewed as part of this Preliminary Site Evaluation, there is no apparent evidence of contamination of any environmental media and no historical information showing possible contamination. As a result it is recommended that no additional environmental evaluation is needed or deemed necessary within Grandview Estates based on the reviewed information. Should additional information become available, this no further action recommendation may be wholly or partially modified.

## 1.0 INTRODUCTION

Montgomery Watson was contracted to perform a Preliminary Site Evaluation (SE) for the United States Army Corps of Engineers (USACE) on a portion of the former Scioto Ordnance Plant (SOP) previously known as the Magazine Area. The former SOP is located northeast of the City of Marion, Ohio (Figure 1). The former Magazine Area has been redeveloped and is now the Grandview Estates housing development (Figure 2). This SE is being performed under the Total Environmental Restoration Contract (TERC), Contract DACW27-97-D-0015, Task Order No. 0005.

### 1.1 PURPOSE AND SCOPE

This Preliminary Site Evaluation was performed to collect available information to support a decision regarding the need for further environmental action within the former Magazine Area. The purpose of this evaluation was to differentiate sites that pose little or no potential threat to human health and the environment from sites that warrant further investigation. This process typically involves compiling and reviewing available reports and documentation about a site and evaluating the available information to determine if additional action is warranted.

The scope of this Preliminary Site Evaluation for the former Magazine Area included research and review of available documents and file information, interviews of local and regulatory agency personnel, and an onsite reconnaissance. These activities can be summarized as follows:

- Review of the USACE Hazardous, Toxic and Radioactive Waste (HTRW) Archives Search Report, dated November 1998;

- Review of the USACE Ordnance and Explosive Waste (OEW) Archives Search Report, dated October 1994;
- Review of the publication "After Forty Years"; by Mosher and Mosher, 1987;
- Interview with Lowell Lufkin; Marion County Department of Health;
- Interview with Mr. Sam Sparling, Empire Builders (May 1999);
- Interview with Mr. Dennis Trachsel, owner Grandview Estates (June 1999);
- Interview with Mr. Donnie Pearson, Former SOP Employee (February 2000);
- Review of Environmental Data Resources, Inc. Report (Appendix A);
- Field reconnaissance of the former Magazine Area (May 1999);
- Review of interviews conducted by the USACE with residents of Marion, Ohio and previous employees of the SOP regarding past site activities, CEW and HTRW Archive Search Reports;
- Review of files and records from Marion Historical Society;
- Review of files at Ohio EPA, Northwest District Office (May 1999); and
- Review of historical aerial photography from years 1951, 1955, 1961, 1970 and 1974 (Appendix B).

The performance of this Preliminary Site Evaluation was conducted for the sole purpose of trying to identify past Army uses of the former Magazine Area and any significant environmental impacts resulting from that past use. This assessment only involved a review of readily available historical information concerning past Army use of the site, and visual observation of the property during a site reconnaissance visit. No sampling, testing or invasive activities were performed as part of this evaluation. The objective of the records review and site reconnaissance was to identify if significant environmental regulatory actions were taken in regard to the site, major spills or incidents which may have occurred during Army use, and/or the location or occurrence of potential sources of significant contamination on the site.

No warranty is expressed or implied as to the accuracy of the documents reviewed as part of this evaluation, and no information was collected or reviewed as to other uses of the site by other parties besides the Army. This Preliminary Site Evaluation was a limited inquiry and additional work would be necessary to identify all potential environmental issues at the site. Should additional information become available that was not reviewed during the performance of this evaluation, the conclusions drawn in this report may be wholly or partially modified. This Preliminary Site Evaluation was prepared for the exclusive use of Montgomery Watson's client, the USACE - Louisville District



## **2.0 SITE DESCRIPTION, HISTORY, AND REGULATORY ACTIONS**

This section presents a description, history and summary of regulatory actions pertinent to the former Magazine Area at the former Scioto Ordnance Plant (SOP) in Marion, Ohio.

### **2.1 LOCATION**

The former SOP is located one mile northeast of Marion, Ohio and was originally built on approximately 12,500 acres of farm land. Approximately 682 acres of this land was utilized for the construction of a Magazine Area (Figure 2). The Magazine Area was bounded on the north by Linn-Hipsher Road, on the east by Pole Lane Road, on the south by an agricultural field that was previously used as a landing strip during SOP operations, and to the west by agricultural fields (Figure 3).

### **2.2 LAND USE**

Prior to 1942, the area that became the SOP was used for agricultural purposes. According to the HTRW Archives Search Report (ASR - 1998) prepared by the USACE, there was no indication of industrial type operations at the site prior to 1942. In 1942, construction of the former SOP began. A storage area of 177 buildings was built as the Magazine Area (Figure 4). In 1956, the land which was once the Magazine Area, was bought by a developer, Mr. Trachsel, owner of Empire Builders. Currently, the former Magazine Area is known as Grandview Estates. Grandview Estates is a housing development consisting of approximately 500 homes and 1,600 to 1,800 residents (Figure 5). A wastewater treatment plant was also constructed within the subdivision. This treatment facility is operated and maintained by Marion County. According to the builder of the homes in Grandview Estates, this is the largest housing community within Marion County outside of the City of Marion.

## **2.3 PHYSICAL SETTING**

The following subsections provide a general description of the physical setting of the Magazine Area of the former SOP, including climate, topography, geology, hydrogeology, surface water conditions, drinking water supplies, and natural resources.

### **2.3.1 Climate**

The climate of Marion County is classified as continental, and the average annual temperature for this area is approximately 50 degrees Fahrenheit (F). The warmest month, July, has an average temperature of approximately 73 degrees F. The coldest month, January, has an average temperature of approximately 25 degrees F. Annual precipitation is approximately 36 inches per year.

### **2.3.2 Topography, Physiography and Drainage**

Marion County lies within the Scioto Lobe of the Indiana-Ohio Till Plain. The surface features include nearly level plains and basins, gently sloping hills and a few moderately steep valley sides. The site is relatively flat with little changes in relief.

Surface drainage at the former SOP site generally drains to the north and west toward Riffle Creek and Grave Creek. Within the former Magazine Area, a ditch that generally drains to the northwest is located from the southeast to the northwest portion of the area. This ditch may contain surface water on a seasonal basis. This ditch drains to Rock Fork Creek, which drains into the Little Scioto River. General overall drainage within the former Magazine Area appears to have been to the west, based on available historical maps of the site.

### **2.3.3 Geology**

Geology underlying the former SOP site consists of bedrock formations, glacial till and soil units of glacial and lacustrine origin. The following sections describe these units in more detail.

**2.3.3.1 Glacial Geology** Marion County was covered by a series of continental glaciers during the Pleistocene epoch of the Cenozoic era, with the most recent advance being 14,000-18,000 years ago. The clayey till deposits found on the surface at the former SOP site is the Late Wisconsin - Late Woodfordian Hiram Lake Till. They are characterized as flat to gently undulating ground moraine. Drift thickness in the area range from 10 to 90 feet (Vormelker, 1985).

**2.3.3.2 Bedrock Geology.** The bedrock in contact with the Pleistocene glacial deposit range from Silurian aged limestone and dolomites in the western portion of the county to Devonian aged limestone and shale in the eastern portion of the county. Regionally, the bedrock dips approximately 19 feet per mile toward the southeast. According to Ohio Department of Natural Resources (ODNR) records, most of the former SOP site is located on top of the Delaware and Columbus limestones. Available water well drilling records indicate depth to bedrock in the vicinity of the former Magazine Area in the range of 30 to 50 feet below grade.

#### **2.3.4 Soils**

Soils originally developed in the area, according to United States Department of Agriculture (USDA), are part of three different associations: The Blount-Pewamo, Pewamo-Elliot, and Milford-Centerburg. The Blount Soil unit is described as a silt loam and consists of somewhat poorly drained soils on slight rises (end and ground moraines). The Pewamo soil unit is described as a silty clay loam and consists of very poorly drained soil on broad flats, in depressions, and along drainageways on ground moraines and end moraines. The Elliot unit is described as a silty clay loam and consists of somewhat poorly drained soil on slight rises and ground moraines. The Milford unit is described as a silty clay loam and consists of very poorly drained soil on broad flats, in shallow depressions, and along drainageways on lake

plains. The Centerburg unit is described as a silt loam and consists of moderately well drained soil in hummocky areas on ground moraines and end moraines.

#### **2.3.5 Natural Resources**

According to the HTRW ASR - 1998, the ODNR states that there are no records of rare or endangered species at the former SOP, including the Magazine Area.

### **2.4 SITE HISTORY**

In March 1942, the government began acquisition of property in Marion County for construction of the Scioto Ordnance Plant. Construction of the former SOP began in May 1942 with the building of a warehouse. By June 1942, the administration building was ready to be occupied and by Fall 1942, production of fuzes and boosters began. Once in operation the former SOP manufactured fuzes and boosters, 20 millimeter bullets, 50 caliber artillery shells, 65 millimeter shells, 75 millimeter shells, incendiary bombs and napalm barrel bombs.

One area, consisting of approximately 682 acres, was utilized for the construction of 177 magazine buildings (Figure 4). Each magazine unit was a one-story, 1,192 square foot square building. The walls were constructed of wood frames with transite siding and roofing. The foundation and floor were concrete. Each building was equipped with two sets of double doors on hinges and two asbestos ventilators through the roof (Figure 6). There were no windows, heating or lighting facilities. According to the Appraisal Report for the Magazine Area (HTRW ASR - 1998), in preparing this area for the magazine section, a large ditch was excavated around the entire area. This ditch was reported as approximately 5 feet deep, and probably placed there to give good drainage and to serve as a fire block.

Also in the HTRW ASR - 1998, a personal interview with a former employee (Mr. Donnie Pearson) at the SOP between 1944 and 1945, states that someone used a bulldozer to dig trenches at the back side of the current Grandview Estates residential area. The trenches are

alleged to be located in the back part of Grandview Estates near two existing concrete buildings near the POW area. For the purposes of this PE, Mr. Pearson was contacted in regards to the Magazine Area and the alleged trenches. Based on this phone conversation, the alleged trench is thought to be located south of the former Magazine Area on the northwest corner of Pole Lane Road and Likens Chapel Road. This area is located approximately ½ mile to the south of Grandview Estates. During this conversation Mr. Pearson was asked if he knew of any activities (trenching or disposal) that may have environmentally impacted the Grandview Estate development. He said that to the best of his knowledge he was not aware of any activity that would have impacted the subject site.

The Army used the magazine buildings for loading, containerizing, transferring, storing and shipping of materials produced at the SOP. According to the HTRW ASR – 1998, crates of fuzes, booster, bullets and bombs were stored in the magazines.

According to the HTRW ASR - 1998, after production ceased within the former SOP at the close of WWII, the magazines were used for the storage of an incendiary mixture known as “goop”. Goop was a magnesium jelly consisting of gelled gasoline and magnesium (HTRW ASR – 1998). According to the HTRW ASR - 1998, 76 of the magazine buildings were used to store surplus goop. It is unknown which of the magazine buildings were used for this purpose. The HTRW ASR – 1998 further states that an Army contractor removed the surplus goop during a five year time period beginning in March 1947. It is reported that the Army contractor used the goop in the manufacturing of paints and other products, presumably at an off-site location (i.e. not within the former Magazine Area). It is not known whether the goop was removed from containers such as 55-gallon drums or from the completed bombs. There are no reports of accidents from goop processing operations at the former Magazine Area. Army troops subsequently dismantled and removed the magazine units from the area.

An appraisal was performed on the Magazine Area in September 1955, and the former magazine area was sold to a developer. At the time of the appraisal, the former Magazine Area included existing roads, approximately 95 concrete slabs from the former magazine buildings, some utility lines, and access to water (HTRW ASR – 1998). In addition, it was reported that a number of open ditches to drain the area and topsoil had been removed from some of the land.

The former Magazine Area was developed into a housing subdivision, later called Grandview Estates. The construction of homes in Grandview Estates began in the late 1950's to early 1960's. At this time, the only remnants of the former Magazine Area were concrete slabs, approximately 44 feet by 40 feet. The majority of the concrete slabs were broken-up and buried during construction of the residential homes (Sam Sparling, personal interview, May 1999). Others were left in place for use by residents.

## **2.5 REGULATORY ACTIONS**

A review of the Ohio EPA files for the former SOP including the former Magazine Area found no indication of any Ohio EPA regulatory actions for this site. In addition, a search of available environmental records was conducted by Environmental Data Resources, Inc. (Appendix A) for the location of the former Magazine Area. The resultant search report meets the government records search requirements of the ASTM Standard Practice for Environmental Site Assessments, E 1527-97. No mapped sites were found in the search of available ("reasonably ascertainable") government records on the subject property. Details of this search and the resultant findings are presented in Appendix A.

### 3.0 PATHWAY AND ENVIRONMENTAL HAZARD ASSESSMENT

This section of the Preliminary Site Evaluation for the former Magazine Area evaluates the different potential pathways for exposure to environmental contaminants and the assessment of whether or not a potential environmental hazard exists relative to these pathways. This evaluation is based solely on the information compiled as part of this project and only those data pertinent to former Army activities at the site.

#### 3.1 GROUNDWATER

According to the available water well drilling logs and ODNR records, the principal water bearing unit in the vicinity of the former Magazine Area is the bedrock limestone directly beneath the glacial till. No direct information was available on the groundwater flow direction in the vicinity of the former Magazine Area; however, it is probably reasonable to assume that flow direction may be coincident with local or regional bedrock dip directions (west to northwest). Water quality within the bedrock aquifer is typically of a potable nature, although localized occurrences of high mineral content due to geologic conditions do exist in Marion County.

Information compiled from other areas within the former SOP indicate that perched or shallow groundwater horizons occur within the overlying glacial till above the bedrock aquifer. There is no direct information from the former Magazine Area on the occurrence of such perched groundwater horizons or the hydraulic interconnection of potential shallow groundwater units within the underlying bedrock aquifer.

During SOP operations, drinking water was furnished by a public water supply company. Currently, residential homes within the Grandview Estates subdivision west of Mercer Drive and Craven Drive utilize private wells for water supply. Residential homes to the east of

Mercer Drive and Craven Drive utilize water supplied by the City of Marion. According to the Marion County Department of Health, at least 25 private wells are present within the Grandview Estates subdivision.

Available records indicate that many of the residential wells are drilled into and draw water from the underlying limestone approximately 32 feet to 46 feet below ground level in the former Magazine Area. According to the Marion County Department of Health (Lowell Lufkin, personal interview, July 1999), recent sampling and testing from 25 of the residential wells within Grandview Estates show no exceedances of any drinking water standards.

On the basis of the site description, operational history, local geology and hydrogeology, and the results of the Marion County Department of Health sampling in the area, the release of hazardous substances to groundwater resulting from past Army use is not suspected.

### 3.2 SURFACE WATER

Within the former Magazine Area, a ditch that generally drains to the northwest is located from the southeast to the northwest portion of the area. This ditch may contain surface water on a seasonal basis. This ditch drains to Rock Fork Creek, which drains into the Little Scioto River. General overall drainage within the former Magazine Area appears to have been to the west, based on available historical maps of the site.

During site reconnaissance visits performed by the Army and by Montgomery Watson personnel as part of this Preliminary Site Evaluation, no visual evidence of material disposal, spills, or waste were identified within the drainage ditches within the former Magazine Area. In addition, during the May 1999 site reconnaissance, no water was observed within the existing drainage ditches onsite.



On the basis of the site description, operational history, local hydrology and a visual site reconnaissance of the Grandview Estates performed by the Army as part of the HTRW ASR – 1998 and by Montgomery Watson personnel in May 1999, a release of hazardous substances from the site to surface water is not suspected. It should be noted that no surface water quality data from the former Magazine Area was available for review as part of this Preliminary Site Evaluation.

### 3.3 SOIL EXPOSURE AND AIR

Grandview Estates is a housing development consisting of approximately 500 homes and 1,600 to 1,800 residents. No visual signs of potential spills or release of hazardous materials was evident during the visual site reconnaissance visits conducted. According to the HTRW ASR – 1998, based on a single interview with a former SOP employee (Mr. Donnie Pearson), there was a suggestion of incendiary bomb components being buried in trenches that are alleged somewhere on the back part of the former Magazine Area, but not within the Grandview Estates boundary. No visual evidence of trenching or disposal was noted during the site reconnaissance. In addition subsequent discussions with Mr. Pearson (MW, Feb 2000) indicate the suspect trenches may be located outside of Grandview Estates and adjacent to the intersection of Pole Lane Road and Likens Chapel Road (Northwest corner).

On the basis of the site description, operational history, local geology, and the results of the visual site reconnaissance, air release of hazardous substances resulting from past Army use is not suspected. It should be noted that no air monitoring or soil data was available for review as part of this Preliminary Site Evaluation.

#### 4.0 SUMMARY AND CONCLUSIONS

The former SOP is located one mile northeast of Marion, Ohio and was originally built on approximately 12,500 acres of farm land. Approximately 682 acres of this land was utilized for the construction of a Magazine Area - a storage area of 177 building used for loading, containerizing, transferring, storing and shipping of materials produced at the SOP. According to the HTRW ASR - 1998, crates of fuzes, booster, bullets and bombs were stored in the magazines. In 1956, the land that was once the Magazine Area, was bought by a developer, Mr. Trachsel, owner of Empire Builders. Currently, the former Magazine Area is known as Grandview Estates. Grandview Estates is a housing development consisting of approximately 500 homes and 1,600 to 1,800 residents.

The purpose of this Preliminary Site Evaluation was to determine if the Grandview Estates site warrants further environmental investigation. On the basis of the available information for the former Magazine Area, the location, description, site history, site characteristics, and likelihood of release to groundwater, surface water, soil, and air were described and characterized. Based on the information reviewed as part of this Preliminary Site Evaluation, there is no apparent evidence of contamination of any environmental media and no historical information showing possible contamination. In concurrence with the recommendations provided with both the HTRW and OEW ASR documents (1994 and 1998), it is recommended that no additional work is needed or deemed necessary within Grandview Estates based on the reviewed information.

## 5.0 REFERENCES

Charles D. Mosher and Delpha Ruth Mosher (1987). The Scioto Ordnance Plant and The Marion Engineer Depot of Marion, Ohio. "A Profile After Forty Years"

Empire Builders Inc.: Interviews with Sam Sparling and Dennis Trachsel

Interview with Mr. Donnie Pearson. Former SOP Employee

Environmental Data Resources, Inc (June 1999). EDR-Radius Map with GeoCheck,

Marion County Department of Health: Interview with Lowell Lufkin

Marion County Engineers Office – File Review

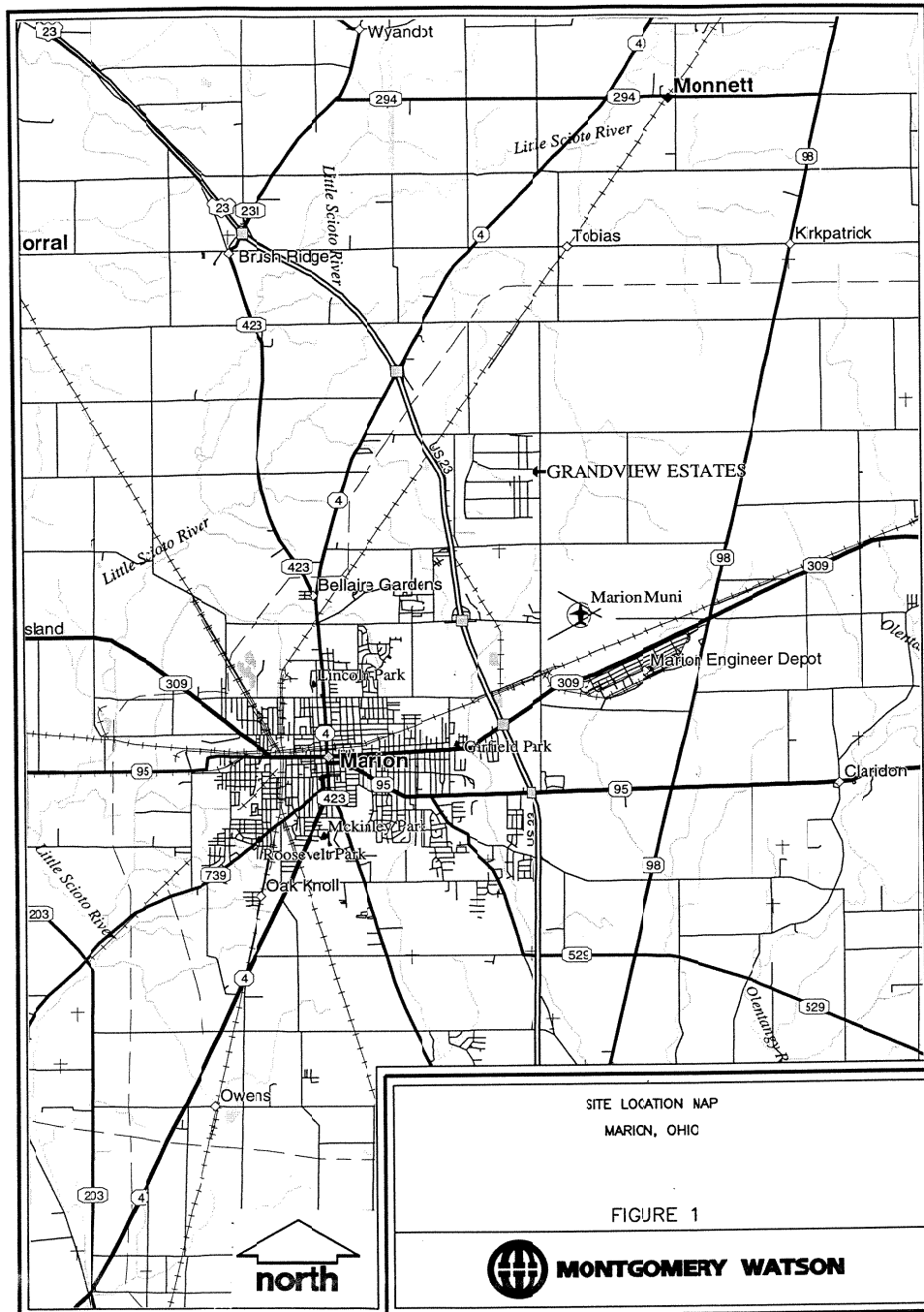
Ohio Department of Transportation. Office of Aerial Engineering, Aerial Photos from 1951, 1955, 1961, 1970, and 1974

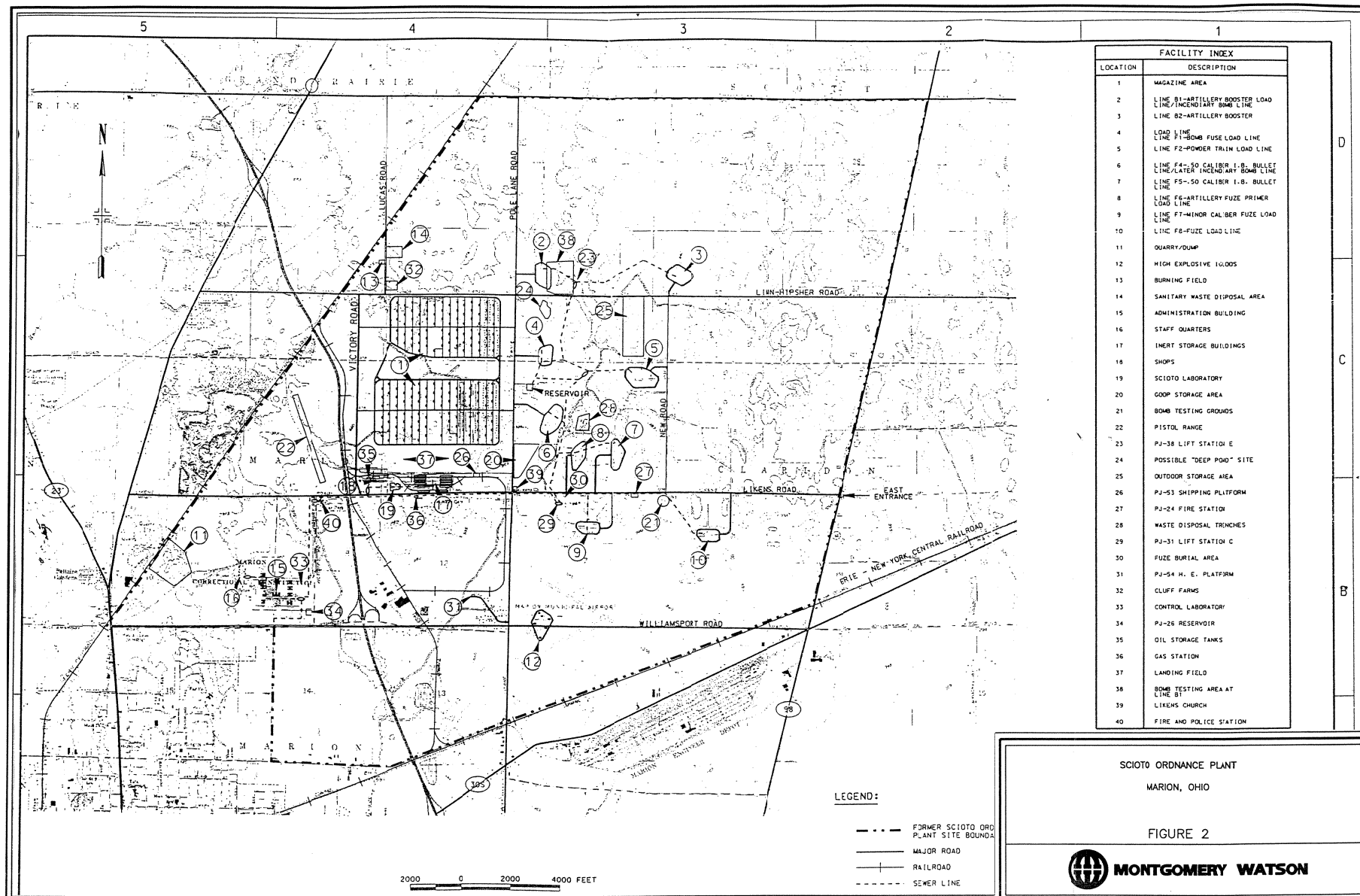
Ohio Environmental Protection Agency; Northwest District Office – File Review

United States Geological Survey, Monnett, Ohio 7.5 Minute Series Topographic Map, 1961 with photo revisions in 1970

United States Army Corps of Engineers (1994). Archives Search Report Findings/Conclusions and Recommendations for the Former Scioto Ordnance Plant

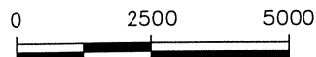
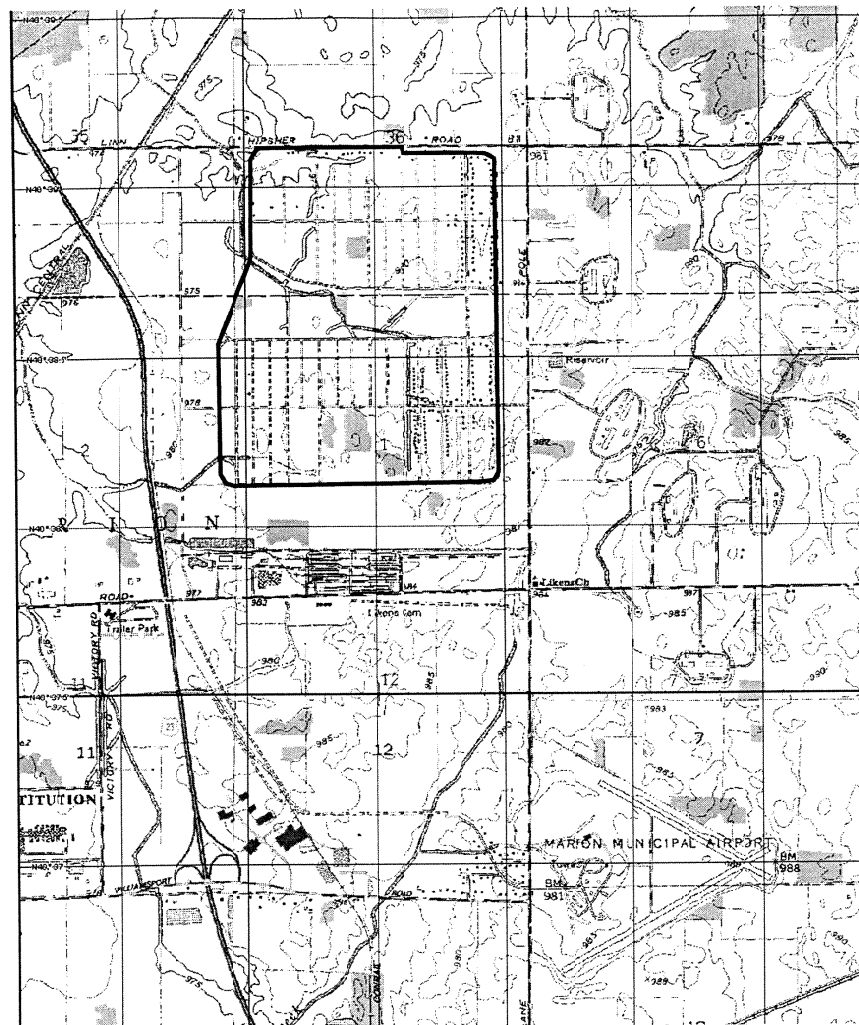
United States Army Corps of Engineers (1998). Archives Search Report for the Former Scioto Ordnance Plant





str 4/28/00

\\jibba\355\cad\fig 3 loc



SOURCE:  
3-D TOPOQUADS, DELORME YARMOUTH, 1999  
MONNETT AND MARION EAST OHIO 7.5 MINUTE  
U.S.G.S. TOPOGRAPHIC QUADRANGLE MAPS  
DATED 1988.

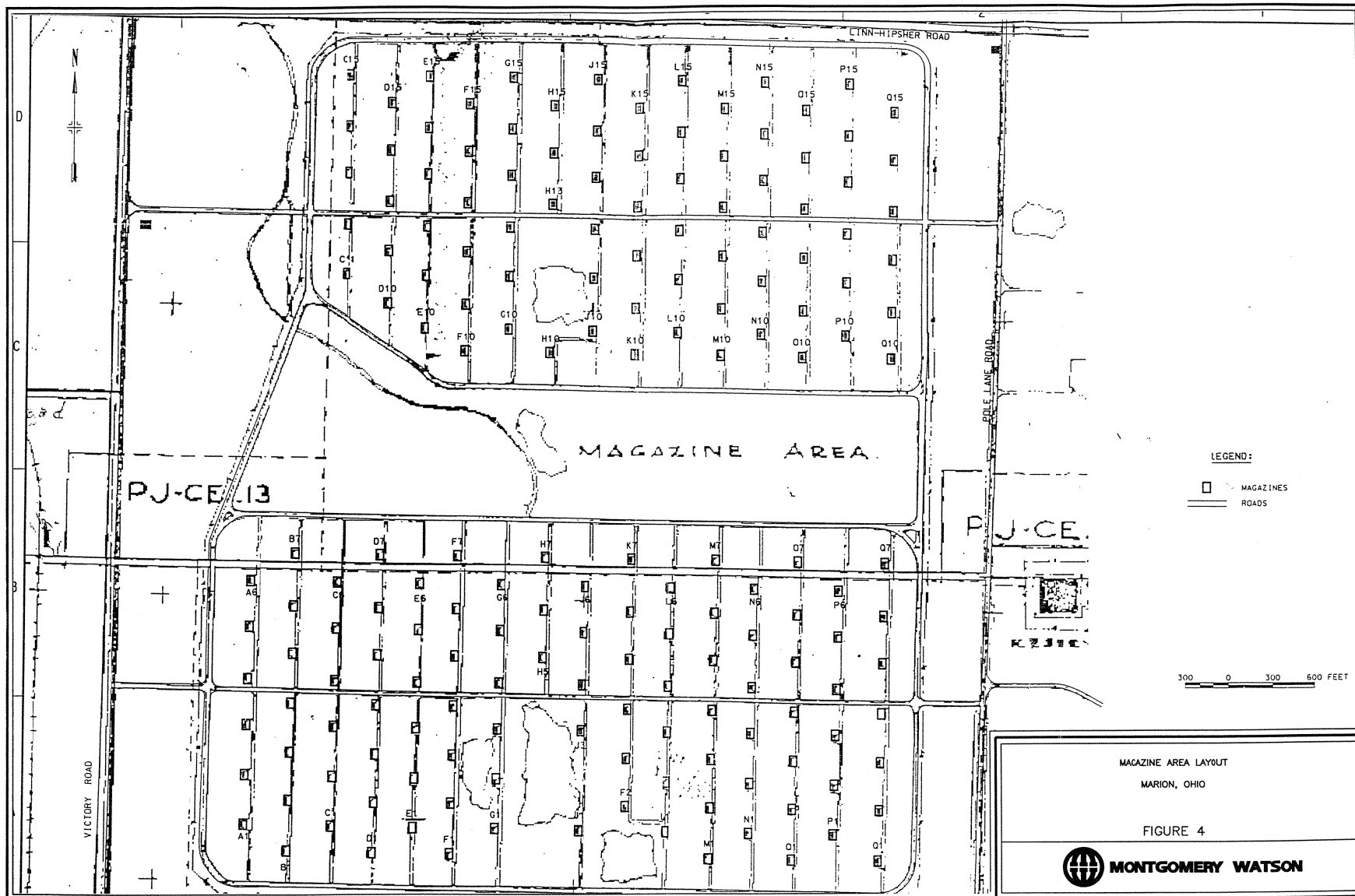
GRANDVIEW ESTATES LOCATION MAP

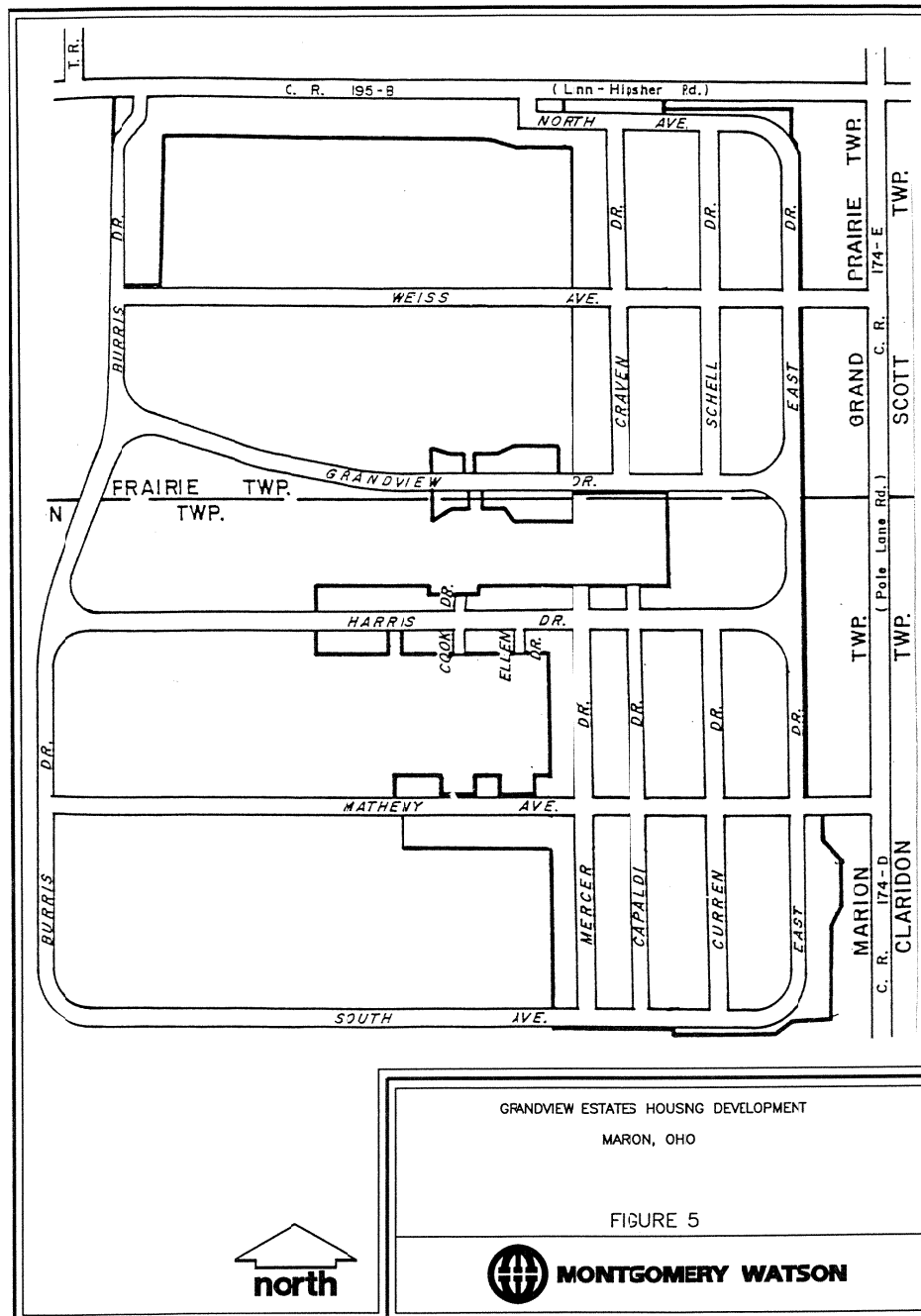
MARION, OHIO

FIGURE 3

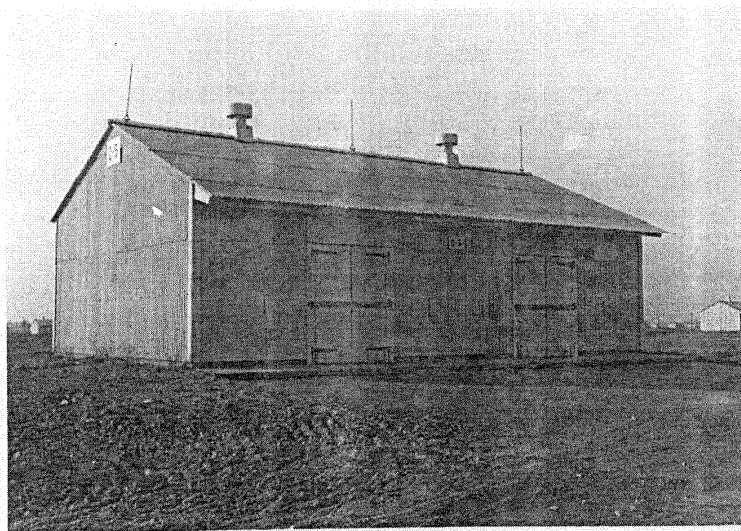


**MONTGOMERY WATSON**









12-3-43/90P-25  
TO ACCOMPANY REPORT ON GOVERN-  
MENT OWNED INDUSTRIAL FACILITIES  
SCIOTO CRIMINAL PLANT

MAGAZINE AREA  
BAY-1 THROUGH 177  
(177 BUILDINGS ALL ALIKE)

CINCINNATI DISTRICT  
CINCINNATI, OHIO  
WAR PROJECT  
EARLIS, OHIO

Figure 6 – 1943 photo of one of the magazine storage buildings